



Culling Rates and Profit

Is there a Management Issue?

Jason Karszes, Senior Extension Associate

PRO-DAIRY

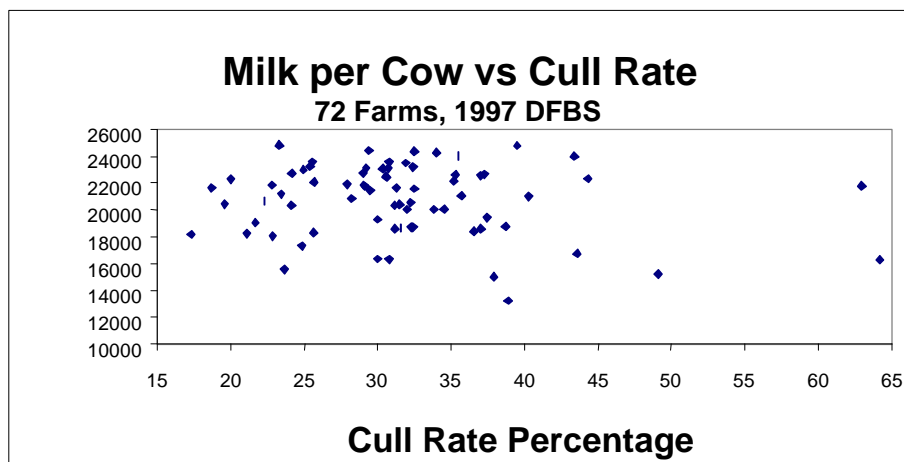
Department of Agricultural, Resource, and Managerial Economics
Cornell University

Culling rates have long been measured and discussed when trying to maintain and improve milk production and genetics. A couple important questions to ask are what is the potential for increased profits on farms and what are the management issues that impact the cull rate? In discussing these issues with dairy producers and agriservice, I have heard different comments and perceptions about the cull rate and what, if any, correlation to different areas and measures in the dairy business. The discussion below addresses some of these questions and uses data that was collected through the Cornell Dairy Farm Business Summary (DFBS) in Western New York. For this discussion, culling rate represents the number of animals that were sold or died in 1997, divided by the average number of milking and dry cows for the 1997 year. The result is then multiplied by 100 to convert to a percentage. Animals that were marketed for breeding and replacements purposes were not included as animals culled.

Culling Perception 1. Farms with higher culling rates maintain higher milk production on a per cow basis.

The assumption here is that low production animals were being culled and replaced with animals that made more milk. This implies that the farm is voluntarily culling cows for low milk production only. Chart 1 is a scatter diagram that reports the milk sold per cow in 1997 and the relationship to culling rates.

Chart 1



There is no statistically significant correlation between milk sold and cull rates in these herds. The highest seven farms for milk production ranged from 23 to 43 percent culling. So while the farm at the highest culling rate may be replacing low producing cows with high producing cows to maintain a high production level, the farm with the lowest culling rate is maintaining a similar milk production level while turning over less animals.

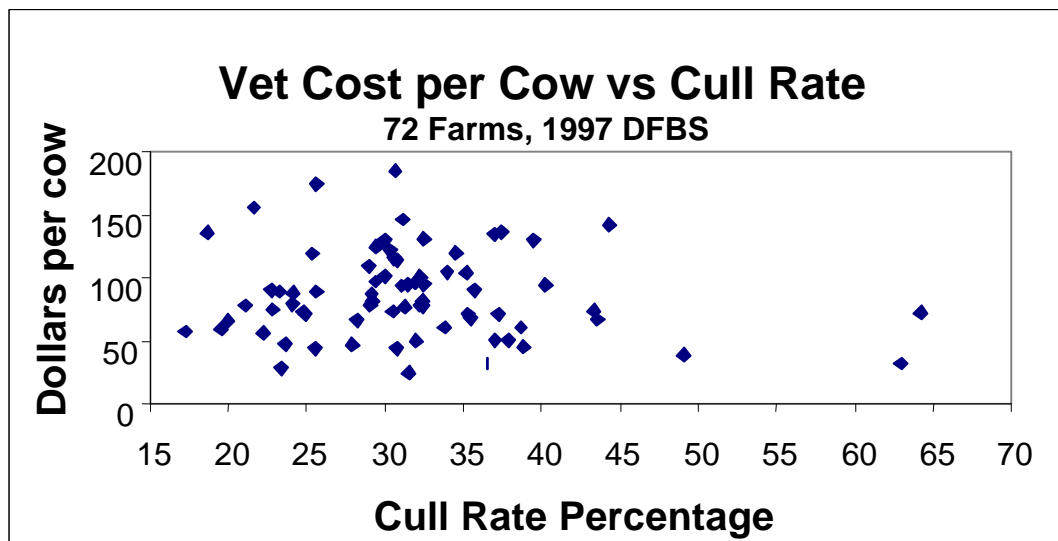
Management Issue 1.

The management question raised from this chart is: What can I do within my herd to lower the overall culling rate while maintaining or increasing milk production and not adversely influence the cost of production.

Culling Perception 2. Farms with higher culling rates have lower vet and medicine expenses.

Farms that are turning over cows faster have a shorter herd life and would not be spending the same amount of money on vaccination and treatment programs as those farms that maintain a longer herd life. While this may be true on farms with voluntary culling decisions, the data as represented in Chart 2 does not support this.

Chart 2



As with Chart 1, there is no statistically significant relationship between cull rates and vet and medicine costs per cow among these farms. The lowest vet and medicine expenses per cow were on farms that maintained cull rates from below 25 to over 60 percent. What appears to be happening on these farms, is that money is being spent on trying to keep cows healthy and prevent them from leaving the herd, but the animals are leaving anyway. A question this chart does raise is whether or not there is such a thing as too low a culling rate. This would be a good

question to ask the four farms that are at, or below 25% culling rate but have vet and medicine costs above \$100 per cow. If these farms are spending large amounts of money to keep cows in the herd for the express purpose of keeping a low cull rate, they may be keeping unprofitable animals in the herd.

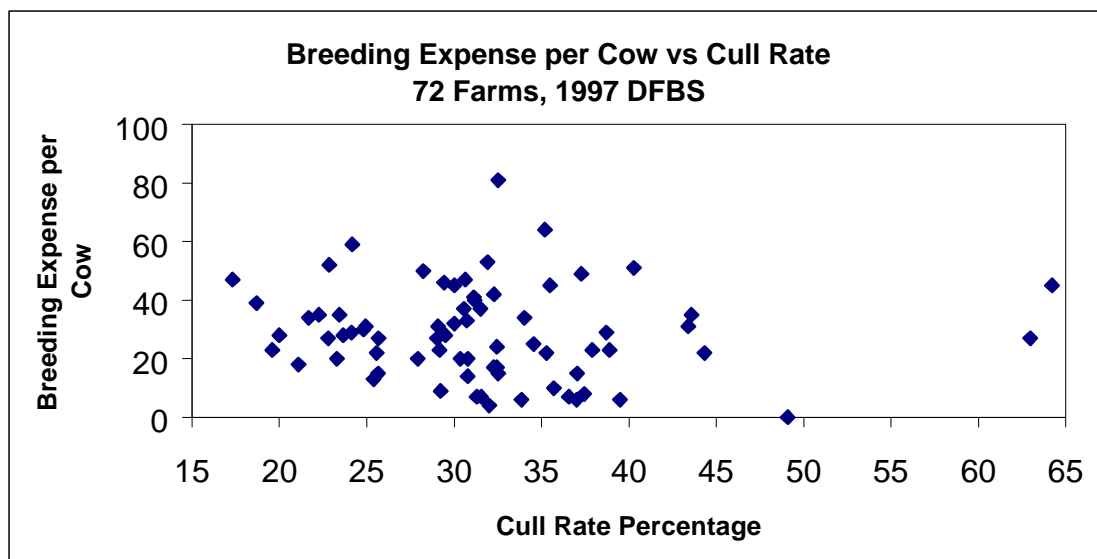
Management Issue 2.

What process can be developed to maintain or lower the vet and medicine expense while maintaining or lowering the culling rate and maintaining or increasing milk production? Or what vet and medicine practice or investment could be used on the farm to maintain or increase milk production while also lowering the cull rate?

Culling Perception 3. Farms with low culling rates have higher breeding expenses.

Farms with high culling rates would not be spending money on trying to breed as many animals, or to maintain a low culling rate, you will be breeding cows multiple times to have them complete a lactation and then start another. Chart 3 plots the breeding expense per cow versus the cull rate percentage for the 72 farms.

Chart 3



As with Chart 1 and 2, there is no statistical significance between cull rates and breeding expense per cow. This may be associated with these farms having one, a high involuntary culling rate and two, breeding problems is one of the main reasons why animals are leaving the herd. These farms are spending the money to get the cows bred, but the cows are still leaving the herd. While the lowest breeding expenses occurred on farms with cull rates over 30 percent, there are significant number of farms with cull rates below 30 percent that have breeding

expenses per cow that are less than \$40 per cow. This implies that some farms are able to maintain low breeding expenses along with a low cull rate.

Management Issue 3.

What management process or protocols can be developed that increases the number of cows that can be bred within the farms desired window at a reasonable expense? Or what needs to be done within the production management program to minimize the number of cows that are culled due to reproduction problems, i.e. they don't get bred back?

Relationship to Profits

Charts 1, 2, and 3 show that for these 72 farms there is no statistical relationship between cull rate and milk production, vet and medicine expenses, and breeding expenses. This implies that it is possible to lower culling rates by addressing management issues within the farm without adversely influencing these three factors. The next management issue to look at is whether or not farms can have a low culling rate and have high profits.

Charts 4 and 5 look at the relationship between culling rate and return on assets and net income per cow, respectively. In Chart 4 the percentage return to assets without appreciation versus the cull rate percentage is plotted. The percent return to assets is the percentage return to the total capital assets on the farm, after a charge for unpaid family labor and the owner operators labor and management is subtracted from net farm income.ⁱ This measure is similar to the interest rate you would earn if you invested in a bank or the stock market.

Chart 4

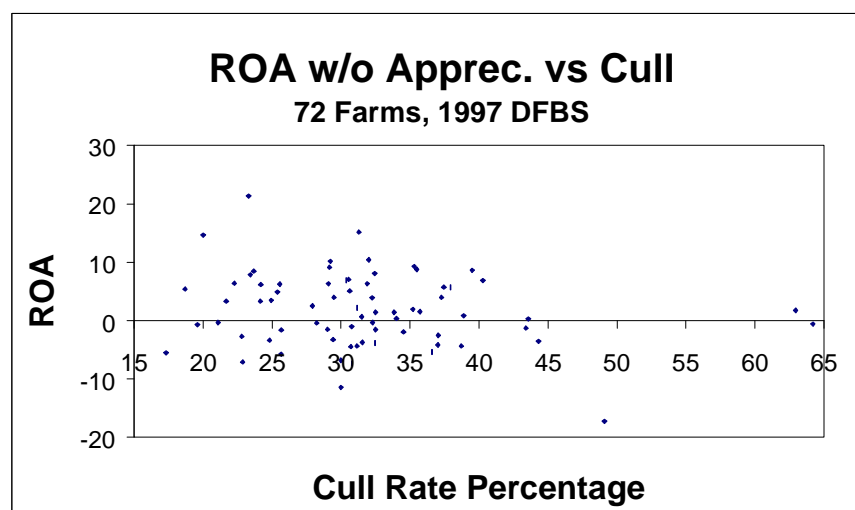
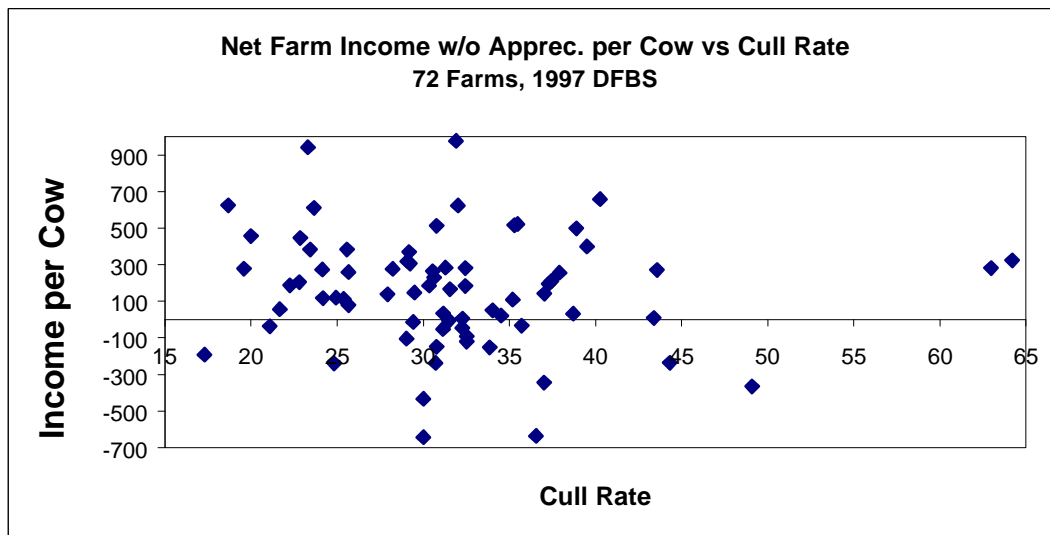


Chart 5



In Chart 5 the net farm income per cow without appreciation is plotted versus the cull rate percentage. Net farm income per cow is the return to the farm for the owners and operators' labor and management, unpaid family labor, and the family's investment in the business.¹

Looking at the two scatter diagrams in Chart 4 and 5 suggests the following three things. First, the highest profit farms for these two measures occurred with cull rates below 35 percent. Second, there are farms that had cull rates below 30 percent that had some of the highest profit measures. Third, just because the cull rate is low doesn't mean that the farm will make a profit.

On dairy farms the expense associated with raising dairy replacements is significant and will affect profitably. A cow generates a return to the family, net farm income, during the year and lactation. When calculating net farm income, the expenses associated with raising replacements is included in the operating expense for the farm, whether they are home grown, custom boarded, or purchased. As replacement expenses increase, the total operating expense for the farm increases, and, all other things staying equal, net farm income decreases. Cull rate, as a measure of how many animals are replaced, and assuming that there is a strong link between number of animals needed and the total cost of the dairy replacement program, may have a strong relationship with net farm income on a per cow basis.

While there may be a strong relationship to profits, there is not a direct relationship. In Chart 4 and 5 there is no statistical significant relationship between profit level and cull rate. A farm may still be profitable with a high culling rate if other facets of the business are performing well, such as labor efficiency, crop production, milk production, cost control, or the dairy replacement program.



With this relationship in mind, there are two management questions to ask. One, what can dairy producers do to maintain or increase milk production, maintain cost control, and lower the culling rate? Even on the farms that are achieving high profits with a high culling rate, there may be areas of opportunity to increase profits by determining why these animals are leaving the herd and doing something about it. Two, if the culling rate on your farm is already low, is the farm at its most profitable point? If cows are kept around just to maintain a low cull rate, are unprofitable cows being kept in the herd?

Designing procedures and protocols to minimize culling rates in a dairy herd, while maintaining or increasing milk production levels and not adversely effecting cost control, may lead to higher net farm income per cow and a higher return on investment. Identifying why animals are leaving a herd and developing protocols to prevent problems that lead to culling should be a large priority on farms that want to maximize net farm income and growth.

If you would like to learn more about how to track the performance of your business and the impact that different management strategies have on financial performance, please contact your local extension service.

ⁱ Please refer to the following publication for further information on the performance of dairy farms in 1997 and how the data is collected and analyzed. "Western and Central Plain Region 1997 Dairy Farm Business Summary" E.B. 98-07, Department of Agricultural, Resource, and Managerial Economics, College of Agriculture and Life Sciences, Cornell University, Ithaca, New York,